۱۴,۷۵

نام: مبینا هدایت الحسینی — دوازدهم مشترک A جمعه

۱-

$$f(x)=2\left[\frac{2-x}{2}\right]+a\left[\frac{x+2}{4}\right] \qquad \left[\frac{a}{4}\right]=?! \rightarrow \left[\frac{2}{4}\right]=0$$

$$\lim_{x\to -2^+} f(x)=\lim_{x\to -2^-} f(x) \leftarrow$$ در $x=-2$ حد دارد

$$2[\overset{1}{\cancel{1^+}}]+a[\overset{a}{\cancel{0^+}}]=2[\overset{2}{\cancel{2^+}}]+a[\overset{0}{\cancel{0^+}}]$$

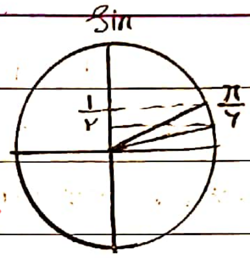
$$2+a=4 \Rightarrow a=2$$

۱,۷۵

۲-

$$\lim_{x\to(\frac{\pi}{6})^-}[2x-1]$$

$$=\left[2\left(\frac{1}{2}\right)^- -1\right]=[0^-]=-1$$



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۳-

$$\lim_{x\to-\frac{1}{2}}[8x^3-x]$$

$$\left[8\left(-\frac{1}{8}\right)-\left(-\frac{1}{2}\right)\right]=\left[-1+\frac{1}{2}\right]=\left[-\frac{1}{2}\right]=-1$$

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۴-

$$\lim_{x\to(\frac{-1}{2})^-}\frac{10x-5+\left[\frac{3}{x^2}\right]}{14x-\left[-\frac{2}{x^2}\right]}$$

$$\left[\frac{3}{(\frac{1}{4})^+}\right]=[12^-]=11$$

$$\left[-\frac{2}{(\frac{1}{4})^+}\right]=[-8^-]=-8$$

$$\Rightarrow \lim_{x\to(-\frac{1}{2})^-}\frac{10x-5+11}{14x+8}=\frac{-5-5+11}{-8^-+8}=\frac{1}{0^-}=-\infty$$

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-۵

$$\lim_{x\to 1^+} \frac{\sin^2 \pi x}{[x]+\cos \pi x} \to \lim_{x\to 1^+} \frac{\sin^2 \pi x}{1+\cos \pi x} \to$$

$$\lim_{x\to 1^+} \frac{(\sin \pi x)(\sin \pi x)}{2\cos^2 \frac{\pi x}{2}} \to \lim_{x\to 1^+} \frac{4\sin^2 \frac{\pi x}{2}\cos^2 \frac{\pi x}{2}}{2\cos^2 \frac{\pi x}{2}} \to$$

$$\lim_{x\to 1^+} 2\sin^2 \frac{\pi x}{2} = \boxed{2}$$

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-۶

$$\lim_{x\to -1} \frac{\sqrt{2x+3}-\sqrt{3x+4}}{1+\sqrt[3]{x}}$$

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$$-x-1 = -(x+1)$$

$$\lim_{x\to -1} \frac{(2x+3)-(3x+4)}{(1+x)} \cdot \frac{(3)}{(2)} = \boxed{-\frac{3}{2}}$$

-۷

$$\lim_{x\to 1} \frac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}} \to \lim_{x\to 1} \frac{2(\sqrt{x}-1)(\sqrt{x}-\frac{5}{2})\,(4)}{4x^2-3x-1}$$

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$$\lim_{x\to 1} \frac{\cancel{4}^{\,2}(\cancel{\sqrt{x}-1})(\sqrt{x}-\frac{5}{2})}{\cancel{4}(\cancel{x-1})(x+\frac{1}{4})} \Rightarrow \lim_{x\to 1} \frac{2(\sqrt{x}-\frac{5}{2})}{(\sqrt{x}+1)(x+\frac{1}{4})} = \frac{-3}{\frac{5}{2}} = \frac{-6}{5} = -1/2$$

$$(\cancel{\sqrt{x}-1})(\sqrt{x}+1)$$

-۸ اگر $\frac{ab}{c}$ ؟

$$\lim_{x\to 0} \frac{a+\sqrt{bx+c}}{x} = \frac{1}{4}$$ باشد

$x \to 0$ ریشه صورت است پس: $c = a^2$ ، $a+\sqrt{c} = 0$

$$\lim_{x\to 0} \frac{\cancel{a^2}-bx-\cancel{c}}{x(2a)} = \frac{1}{4} \to \lim_{x\to 0} \frac{-b\cancel{x}}{4a\cancel{x}} = \frac{1}{4} \to$$

$$\boxed{b = -\frac{1}{2}a} \Rightarrow \frac{ab}{c} = \frac{a\times(-\frac{1}{2}a)}{\cancel{a^2}} = \boxed{-\frac{1}{2}}$$

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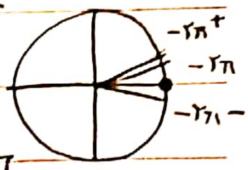
$* \; x > -2\pi \longrightarrow \frac{x}{\pi} > -2$

$* \; x < -2\pi \longrightarrow \frac{x}{\pi} < -2$

۹ـ

$$\lim_{x\to -2\pi} \frac{4+k\left[\frac{x}{\pi}\right]}{\sin x} = +\infty$$

$$-2\pi^+ : \lim_{x\to -2\pi^+} \frac{4+k\left[\frac{-2\pi^+}{\pi}\right]}{\sin x} \longrightarrow \lim_{x\to -2\pi^+} \frac{4+k\,\overset{-2}{\cancel{[-2^+]}}}{\sin x}$$



$$\lim_{x\to -2\pi^+} \frac{(4-2k)^{>0}}{(\sin x)_{0^+}} = +\infty \Rightarrow 4-2k>0 , \quad 4>2k \to \boxed{k<2} \;(\mathrm{I})$$

$$-2\pi^- : \lim_{x\to -2\pi^-} \frac{4+k\left[\frac{-2\pi^-}{\pi}\right]}{\sin x} \longrightarrow \lim_{x\to -2\pi^-} \frac{4+k[-2^-]}{\sin x}$$

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$$\lim_{x\to -2\pi^-} \frac{(4-3k)^{<0}}{(\sin x)_{0^-}} = +\infty \quad 4-3k<0 , \quad 4<3k \to \frac{4}{3}<k$$

$$(\mathrm{I}) \cap (\mathrm{II}) : \frac{4}{3}<k<2 \Rightarrow -2<-k<\frac{-4}{3} \Rightarrow \boxed{[-k]=-2}$$

۱۰ـ

$$\lim_{x\to 8} \frac{b\sqrt{2+\sqrt[3]{x}}-2b}{ax-b} \quad \frac{0}{0} \qquad 8a=b \;*$$

$$b^2(-2+\sqrt[3]{x})$$

$$\lim_{x\to 8} \frac{\overset{2b^2-b^2\sqrt[3]{x}}{b^2(2+\sqrt[3]{x})-4b^2}}{(ax-b)(4a)} \longrightarrow \lim_{x\to 8} \frac{-2b^2+\sqrt[3]{x}\,b^2}{(ax-b)(4b)} \;*$$

۴

$$\lim_{x\to 8} \frac{b(\sqrt[3]{x}-2)}{ax-8a} \longrightarrow \lim_{x\to 8} \frac{\overset{8a}{b}\,\cancel{(\sqrt[3]{x}-2)}}{4a\,(x-8)}$$

$$(\cancel{\sqrt[3]{x}-2})(\sqrt[3]{x^2}+2\sqrt[3]{x}+4)$$

$$\Rightarrow \lim_{x\to 8} \frac{2}{\sqrt[3]{x^2}+2\sqrt[3]{x}+4} = \frac{2}{12} = \boxed{\frac{1}{6}}$$